State of Vermont
Department of Health
Actuarial Study of the Needed Bed Capacity for Adult Mental Health Inpatient Services

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I. EXECUTIVE SUMMARY

The Vermont Department of Health (VDH) contracted with Milliman, Inc. (Milliman) and The Management Group (TMG) to conduct an actuarial study of the needed bed capacity for adult mental health inpatient services as part of the Vermont Futures Plan.

The Milliman/TMG team has combined actuarial expertise and extensive programmatic and administrative knowledge of recovery-based mental health programs and systems of care. Our analysis is not just quantitative in nature, but also takes into account the operational realities of administering community-based mental health care on a day-to-day basis.

Milliman is the lead consultant and is responsible for the analysis presented in this report. TMG's primary contribution within this partnership was to assess the likely impact that the Vermont Futures Plan will have on the long-run capacity needs for adult mental health inpatient services.

Futures Plan Background

The Futures Plan was developed by the Vermont Division of Mental Health and an advisory group of key stakeholders to plan for the replacement of the services currently provided by the Vermont State Hospital (VSH) within the context of long-range planning for a comprehensive continuum of care for mental health services.

The Futures Plan proposes the closing of VSH and the distribution of VSH's current 54-bed capacity across programs offering different levels of care. The proposed breakdown of the new and relocated beds is summarized below:

- **Secure residential (6 beds, relocated from VSH):** Six beds would be assigned to a secure residential program for individuals who are considered a danger to society and have been assigned to the custody of the commissioner, but who are not in need of hospital or sub-acute levels of care.

- **Sub-acute care (16 beds, relocated from VSH):** Sixteen beds would be assigned to one or more sub-acute programs for individuals who need intensive rehabilitation, but do not need to be hospitalized.

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- **Inpatient beds, including psychiatric intensive care units (ICUs) (32 beds, relocated from VSH):** The remaining 32 beds relocated from VSH would be assigned to programs offering inpatient hospital care. Twelve of these 32 beds would be assigned to ICUs.

- **Diversion (10 new beds):** Ten new diversion beds are planned to augment the 19 existing diversion beds in programs run by Designated Agencies around the state.

Conclusion – Needed Adult Mental Health Inpatient Bed Capacity Depends on Implementation of Vermont Futures Plan

Our report considers three scenarios for the implementation of the Futures Plan:

- **Scenario 1: Status quo remains –** Under Scenario 1, none of the changes proposed in the Futures Plan would be implemented. The VSH would operate as it currently does. The additional proposed community resources would not be created. The only changes to the need for adult mental health inpatient services are driven by demographic shifts and normal utilization trends. Scenario 1, while not very likely, is still very useful as a baseline scenario to determine what the needed bed capacity would be without the changes to the delivery system proposed in the Futures Plan. Scenario 1 projects the needed bed capacity at VSH (or successor facility) at 64 beds in 2016.

- **Scenario 2: Partial implementation –** Under Scenario 2, construction of the new inpatient facility and non-inpatient alternatives is not fully implemented. Community resources are not fully funded or staffed. Scenario 2 is a mid-point between Scenario 1 and Scenario 3. Scenario 2 projects the needed bed capacity at VSH (or successor facility) at 56 beds in 2016.

- **Scenario 3: Full implementation –** All aspects of the Futures Plan are fully funded, fully staffed with qualified providers, and completed according to schedule. Scenario 3 is the best case scenario and shows what is possible under the best circumstances. Scenario 3 projects the needed bed capacity at VSH (or successor facility) at 48 beds in 2016.

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Table 1 summarizes the results of each scenario by the three levels of care environed in the Futures Plan: Intensive Care Unit (ICU), Specialized Inpatient Unit (SIP Unit), and General Psychiatric Unit (General). The Futures Plan envisions that the ICU and SIP Unit levels of care will be provided at the new facility.

Table 1
State of Vermont, Department of Health
Projection of 2016 Adult Mental Health Inpatient Needed Bed Capacity by Level of Care
Range of Scenarios

Level of Care	Scenario 1 Status Quo	Scenario 2 Partial Implementation	Scenario 3 Full Implementation
ICU	7.0	7.0	7.0
SIP Unit	57.0	49.0	41.0
General	119.5	117.0	114.5

An important assumption in our projections is the effect of new consumers wishing to use newly created community resources (the "woodwork effect"). We assumed that the woodwork effect impacts 25% to 50% of the utilization of the new community resources, decreasing the current VSH patients who could be shifted to these new resources.

These Scenarios are not predictions of what will happen in the future, but rather scenarios based on selected assumptions that we believe are appropriate. It is difficult to measure the level of pressure on community services and how the use of those services will increase if additional resources are made available. Thus it is important to monitor the progress of creation of new resources and the community response to their presence, so that adjustments can be made throughout the process.

Important Limitations and Caveats

Differences between our projections of inpatient capacity needs and actual needs will depend on the extent to which future experience conforms to the assumptions made in our calculations. It is certain that actual experience will not conform exactly to the assumptions used.

Our report is intended for the internal use of VDH to determine inpatient mental health needs from 2006 - 2016. It may not be appropriate for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. It

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The results of this report are technical in nature and are dependent upon specific assumptions and methods. No party should rely on these results without a thorough understanding of those assumptions and methods. Such an understanding may require consultation with qualified professionals.

Section II of this report evaluates the historical use of adult mental health inpatient services in Vermont. Section III of this report documents the expected impact of the Vermont Futures Plan on the use of adult mental health inpatient services. Section IV of this report discusses expected impact of other factors. Section V presents our estimated adult mental health inpatient bed capacity by level of care for 2016.

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II. HISTORICAL USE OF MENTAL HEALTH SERVICES IN VERMONT

This section of our report presents an evaluation of the historical use of inpatient mental health services in Vermont. Our initial step in estimating future inpatient mental health needs in Vermont was to understand what services were available and how services have been utilized in past.

Summary of Current Average Daily Census by Level of Care

We estimated the following average daily census by level of care as the starting point for our projection of future adult mental health inpatient services, shown in Table 2:

Table 2
State of Vermont, Department of Health
Summary of Current Estimated Average Daily Census by Level of Care
Adult Mental Health Inpatient Services

Hospital	ICU*	SIP Unit**	General	Total
Vermont State Hospital	4.6	42.2	4.6	51.4
Other Hospitals	1.0	3.5	90.6	95.1
Total	5.6	45.7	95.2	146.5

* Intensive Care Unit
** Specialized Inpatient Unit

The average daily census by level of care is a product of the average 2003 – 2005 total daily census for adult mental health inpatient services (Table 3) multiplied by the percentage of inpatient days at each level of care by facility (Table 4).

Methodology

We evaluated the following data sources to determine the inpatient mental health use in Vermont's adult population over the past 5 years:

- Vermont State Hospital data from 2000 – 2005
- Vermont public use inpatient discharge data sets from 2000 – 2004

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- New Hampshire public use inpatient discharge data sets from 2000 – 2004
  - We limited our analysis to Vermont residents seeking care in New Hampshire hospitals.
- Summary utilization information for the Brattleboro Retreat for 2000 - 2003, as presented in the VDH publication titled "Inpatient Behavioral Health Care Services Provided to Vermont Residents During 1990 – 2003" published in August 2005.

We compared and validated our results using summary data compiled by VDH, including:

- The VDH publication titled "Inpatient Behavioral Health Care Services Provided to Vermont Residents During 1990 – 2003" published in August 2005, and
- The VDH Fiscal Year 2005 Statistical Report published on October 30, 2005.

We developed the following summaries to assist us in our understanding of the current use of and to provide a basis for our projections of the future use of adult mental health inpatient services:

- The average daily census by year and hospital for adult mental health inpatient services
- Allocation of the average daily census by estimated level of care (intensive care unit, specialized care unit, general care)
- The average length of stay for adult mental health inpatient services by hospital
- The distribution of admissions to VSH by length of stay
- The payer mix of each hospital for adult mental health inpatient services

Average Daily Census

We summarized the data to determine the number of patient days provided in each facility. We divided the number of patient days per year by the number of days in the year to determine an average daily census. Table 3 below summarizes the average daily census in each facility for adult mental health inpatient services.

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Table 3
State of Vermont, Department of Health
Summary of Average Daily Census by Hospital and Year
Adult Mental Health Inpatient Services

Hospital	2000	2001	2002	2003	2004	2005	Avg. 2003 to 2005
Vermont Hospitals							
Vermont State Hospital	50.2	53.2	55.9	51.3	51.7	51.1	**51.4**
Brattleboro Retreat	23.4	26.0	22.8	24.0	N/A	N/A	**24.0**
Central Vermont Hospital	8.0	8.6	10.7	9.6	10.2	N/A	**9.9**
Fletcher Allen Health Care	19.9	20.1	18.9	22.2	20.5	N/A	**21.4**
Rutland Regional Med Ctr	7.2	9.5	9.6	8.4	7.3	N/A	**7.9**
Springfield Hospital	10.0	11.0	12.0	12.8	12.8	N/A	**12.8**
Veterans Administration	7.6	8.6	8.0	9.4	8.4	N/A	**8.9**
Other Vermont Hospitals	1.9	0.9	1.1	0.9	0.7	N/A	**0.8**
New Hampshire Hospitals (VT Residents Only)							
M.H. Psychiatric Unit	5.9	7.2	7.1	8.1	8.4	N/A	**8.3**
Other NH Hospitals	0.5	0.7	1.1	1.2	1.0	N/A	**1.1**

VDH provided a data set of patients receiving care at VSH from 2000 – 2005. We identified adult mental health inpatient services in the Vermont and New Hampshire Public Use Discharge Database by identifying admissions with a DRG in the range of 424 – 432 provided to a Vermont resident age 18 and over.

We established the average daily census from 2003 – 2005 as the base utilization for our projection of future adult mental health inpatient services.

Allocation of Use by Level of Care

VDH has identified three levels of mental health inpatient care it will provide under the Futures Plan:

1. **General Psychiatric Units** – includes voluntary treatment for psychiatric illness as well as Designated Hospital (DH) units that have expanded their role to provide involuntary care by enhancing security of their units.

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2. **Specialized Inpatient Unit (SIP Unit)** – the current level of care provided by VSH. Patients share the following characteristics:
    a. Almost exclusively admitted on an involuntary basis,
    b. Refuse medication and often other forms of treatment,
    c. Likely have a diagnosis of schizophrenia or other psychotic disorder, and
    d. Have, on average, lengths of stay greater than 30 days.

    Characteristics of a SIP unit include higher RN to patient ratios, psychiatrically trained direct care staff, psychiatrists with special expertise, and easy access to general medical care. The physical characteristics of a SIP unit must be optimized for safety.

3. **Intensive Care Unit (ICU)** – an ICU is a more enhanced version of a SIP unit, providing acute, stabilizing care and allowing for maximum containment of patients most at risk of violence to self and others. This level of care does not currently exist at VSH. Currently, patients needing an ICU level of care are managed at VSH with increased staffing and are more likely to require emergency involuntary interventions.

    The main distinguishing features of the ICU would be size, configuration of physical space, monitoring capability, increased staffing ratios, and more experienced staff.

We estimated the portion of the historical adult mental health inpatient utilization falling into each of the three levels of care identified in the Futures Plan. Our methodology is described below:

1. **ICU** – We first identified days of care that would likely be provided in the ICU level of care. It is very difficult to obtain a precise count of ICU days using historical discharge and utilization data. We examined several methodologies, including targeting certain diagnoses, before arriving at using the occurrence of involuntary interventions as a proxy for an ICU level of care.

    Using data provided by VDH, we identified occurrences of involuntary medication, restraint, and seclusion. We estimated that the ICU level of care would be required for a five-day window around the involuntary intervention. We discussed our

assumptions with VDH and they agreed our assumption is a reasonable approximation.

2. **SIP Unit** – We assumed any patient with a length of stay of 60 or more days required the SIP unit level of care. VDH confirmed this as the target population for SIP unit care.

3. **General Psychiatric Unit** – Any day of care not meeting the ICU or SIP unit criteria was assumed to be provided at the General Psychiatric Unit level of care.

Our analysis of the VSH data and non-VSH data showed the following distribution of days by level of care:

Table 4
State of Vermont, Department of Health
Summary of Distribution of Days by Level of Care
Adult Mental Health Inpatient Services

Level of Care	VSH	Fletcher Allen	Rutland Regional	Central Vermont	Springfield	Other
ICU	9.0%	1.8%	3.2%	3.4%	0.1%	0.0%
SIP Unit	82.1%	4.3%	5.0%	3.1%	2.3%	3.7%
General	8.9%	93.9%	91.8%	93.5%	97.6%	96.3%

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Average Length of Stay

We summarized the average length of stay for each hospital and year for adult mental health inpatient services. Table 5 shows a summary of length of stay for 2000 – 2005.

Table 5
State of Vermont, Department of Health
Summary of Average Length of Stay by Hospital and Year
Adult Mental Health Inpatient Services

Hospital	2000	2001	2002	2003	2004	2005
Vermont Hospitals						
Vermont State Hospital	69.95	64.68	74.99	71.53	68.12	76.10
Brattleboro Retreat	15.35	12.81	10.34	10.30	N/A	N/A
Central Vermont Hospital	6.65	6.99	7.44	7.51	7.62	N/A
Fletcher Allen Health Care	10.27	10.69	10.02	10.05	7.78	N/A
Rutland Regional Medical Center	5.42	6.85	6.95	5.89	5.02	N/A
Springfield Hospital	7.71	7.81	6.97	8.08	8.70	N/A
Veterans Administration	6.72	8.54	7.62	9.30	7.99	N/A
Other Vermont Hospitals	5.72	3.60	3.72	3.64	3.77	N/A
New Hampshire Hospitals (Vermont Residents Only)						
M.H. Psychiatric Unit	5.74	7.52	7.50	7.18	7.11	N/A
Other New Hampshire Hospitals	4.95	4.32	6.96	6.90	5.60	N/A

VSH has a much longer length of stay, reinforcing its role as the provider of services to Vermont residents with the most severe mental illnesses. In general, Brattleboro Retreat and Fletcher Allen Health Care have longer lengths of stay than the other non-VSH hospitals, though Fletcher Allen's length of stay dropped over 2 days from 2003 to 2004, to be similar to the other non-VSH hospitals.

Distribution of Admissions to VSH by Length of Stay

We also summarized VSH admissions from 2000 – 2005 by length of stay to investigate the length of stay pattern. Table 6 shows that while a quarter of all admissions last one week or less, about 10% of admissions last for more than six months. If VDH can provide alternate levels of care that satisfy the needs of VSH's long term patients and/or reduce the length of stay of other VSH patients, overall inpatient capacity can be reduced.

Table 6
State of Vermont, Department of Health
Distribution of Length of Stay at the Vermont State Hospital
All Patient Days 2000 – 2005

Length of Stay at VSH	Number of Admissions	Percent of Admits	Cumulative Percent of Admits
0-1 week	345	25.6%	25.6%
1-2 weeks	181	13.4%	39.0%
2-3 weeks	108	8.0%	47.0%
3-4 weeks	79	5.9%	52.8%
4-5 weeks	64	4.7%	57.6%
5-6 weeks	52	3.9%	61.4%
6-7 weeks	47	3.5%	64.9%
7-8 weeks	30	2.2%	67.1%
8-9 weeks	31	2.3%	69.4%
9-10 weeks	30	2.2%	71.6%
10-11 weeks	22	1.6%	73.3%
11-12 weeks	31	2.3%	75.6%
3-4 months	87	6.4%	82.0%
4-5 months	53	3.9%	85.9%
5-6 months	50	3.7%	89.6%
6-7 months	26	1.9%	91.6%
7-8 months	15	1.1%	92.7%
8-9 months	12	0.9%	93.6%
9-10 months	14	1.0%	94.6%
10-11 months	7	0.5%	95.1%
11-12 months	9	0.7%	95.8%
1-1.5 years	22	1.6%	97.4%
1.5-2 years	12	0.9%	98.3%
2-2.5 years	6	0.4%	98.7%
2.5-3 years	5	0.4%	99.1%
3-3.5 years	3	0.2%	99.3%
3.5-4 years	1	0.1%	99.4%
4+ years	8	0.6%	100.0%

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Hospital Payer Mix

We examined what payers reimbursed each facility for adult mental health inpatient services. We found that government payers (Medicare, Medicaid, and free care at VSH) dominated the payer mix for all facilities. The payer mix emphasizes that the financial viability of inpatient mental health programs are highly dependent on reimbursement from public sources.

Table 7
State of Vermont, Department of Health
Payer Mix by Hospital
Percentage of Inpatient Days 2000 – 2005

Payer	Vermont State Hospital	Other Vermont Hospitals	New Hampshire Hospitals
Medicare	29%	33%	40%
Medicaid	4%	28%	22%
Free Care	64%	2%	0%
Commercial Insurance	1%	19%	32%
Self Pay	0%	4%	6%
Other	2%	14%	0%

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III. EXPECTED IMPACT OF THE VERMONT FUTURES PLAN ON THE USE OF MENTAL HEALTH INPATIENT SERVICES

This section of our report evaluates the expected impact of the Vermont Futures Plan on the use of adult mental health inpatient services. Our findings are summarized below and developed in the rest of this section of our report:

- Scenario 1 – Status Quo
  - The Futures Plan is not implemented, so there is no change related to the Futures Plan.

- Scenario 2 – Partial Implementation
  - We project an 8 day reduction in the current average daily census of adult mental health inpatient services at the ICU and SIP Unit level of care (the target services at the new facility envisioned in the Futures Plan).

- Scenario 3 – Full Implementation
  - We project a 16 day reduction in the current average daily census of adult mental health inpatient services at the ICU and SIP Unit level of care (the target services at the new facility envisioned in the Futures Plan).

Our evaluation encompassed:

- A review of the Futures Plan to understand how the adult mental health delivery system is expected to change over the next ten years,

- A series of informational interviews with key stakeholders in the Vermont mental health system, including providers, consumers, government officials, and advocates,

- The development of three potential implementation scenarios for the delivery system changes set forth in the Futures Plan, and

- An estimate of the impact of the three implementation scenarios on the use of adult mental health inpatient services.

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Summary of Vermont Futures Plan

We have briefly summarized the Futures Plan to provide some background regarding the planned changes to Vermont's adult mental health delivery system.

The Futures Plan was developed by the Vermont Division of Mental Health and an advisory group of key stakeholders to plan for the replacement of the services currently provided by the Vermont State Hospital (VSH) within the context of long-range planning for a comprehensive continuum of care for mental health services.

The Futures Plan proposes the closing of VSH and the distribution of VSH's current 54-bed capacity across programs offering different levels of care. The plan also calls for increased spending on housing, transportation and legal services, enhanced peer resources and support, and a care management program that will ensure Vermonters have access to the appropriate level of treatment within a participating network of inpatient, crisis stabilization, residential, and outpatient services.

The proposed breakdown of the new and relocated beds is summarized below:

- **Secure residential (6 beds, relocated from VSH):** Six beds would be assigned to a secure residential program for individuals who are considered a danger to society and have been assigned to the custody of the commissioner, but who are not in need of hospital or sub-acute levels of care.

- **Sub-acute care (16 beds, relocated from VSH):** Sixteen beds would be assigned to one or more sub-acute programs for individuals who need intensive rehabilitation, but do not need to be hospitalized.

- **Inpatient beds, including psychiatric intensive care units (ICUs) (32 beds, relocated from VSH):** The remaining 32 beds relocated from VSH would be assigned to programs offering inpatient hospital care. Twelve of these 32 beds would be assigned to ICUs.

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- **Diversion (10 new beds):** Ten new diversion beds are planned to augment the 19 existing diversion beds in programs run by Designated Agencies around the state. The diversion beds would be available for the following types of care:
  - Triage and observation care (24 hours)
  - Crisis stabilization care (24 – 48 hours)
  - Hospital alternative care (3 – 7 days)
  - Hospital step-down care (24 – 72 hours)

VDH envisions the Futures Plan as an opportunity to establish a state-of-the-art intensive care program, integrated into a mental health system that links prevention, early intervention, treatment, and ongoing support programs, and that helps Vermonters with mental illness and emotional disturbances achieve full recovery.

Much more detail is available in the full Vermont State Hospital Futures Plan, available from VDH.

Results of Informational Interviews with Key Stakeholders

TMG consultants conducted focus groups with various providers and community representatives including consumer run service representatives. The focus groups were organized around a common set of questions developed on the basis of information presented in the Futures Plan document as well as subsequent developments and updates to that plan as published on the State website.

The focus of the questions was to obtain information regarding the functioning of the current system; both as it serves those in need of an inpatient setting as well as the community based services throughout Vermont. The questions were framed to gather information regarding the impact on mental health inpatient capacity. Focus groups were held locally or through phone conferencing.

The following groups participated in the focus groups:

- Vermont Inpatient Mental Health Group
- Vermont Inpatient Workgroup – Vermont State Hospital Staff
- Vermont State Acute Care Team
- Vermont Mental Health Designated Agency representatives – CRTs

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- Futures Advisory Committee
- Vermont Health Department
- Vermont Psychiatric Survivors – Consumer-run Program
- NAMI – representatives joined with Futures Advisory Committee group
- Department of Corrections

Results of Focus Group Discussion

The Focus Groups generally believed that the current mental health services are appropriate but that additional resources are needed for the community services in order to maintain their effectiveness. They believe that the Futures Plan can be implemented successfully only if the community resource portion is fully funded.

The groups presented diverse perspectives. The Designated Hospital staff and the Vermont State Hospital staff believed that the current level of inpatient beds was either minimally sufficient or not sufficient. In addition, they questioned the likelihood that the new residential facilities would be either suited for the consumers currently in need of VSH level of care or, if built, would reduce the required inpatient beds.

General themes:

- There is not currently enough funding for the community based services. The required services do not necessarily exist in the communities of need and those that do exist are not sufficiently staffed.

- Staff turnover in the community-based services is a large problem that stresses the system and ultimately impacts inpatient capacity. A good relationship with providers creates consumer stability and reduces anxiety that leads to periods of crisis.

- The "woodwork effect" (new consumers wishing to use newly available resources) will be significant if new residential services are created. If the new sub-acute facilities are restricted to consumers in VSH there will be excess capacity. If consumers are allowed to enter the facilities without having been admitted to VSH the planned reduction in inpatient beds through the movement of VSH consumers to the sub-acute facilities will not be achieved.

- The staff to consumer ratio in the CRT programs is too high. If no additional funding is provided to decrease the ratio and address the high staff turnover the number of inpatient beds required will increase.

- If Act 114 is not changed so involuntary medications can be administered in settings other than VSH, it will not be possible for any planned change to occur. There is a core value in Vermont to minimize involuntary treatments. Increased opportunities for involuntary interventions create a slippery slope that is disapproved of by most of the groups.

- Reductions to inpatient capacity have been made in the past. There needs to be recognition that there is a critical minimum. The recognition that "if you build it they will come" exists, but to go below the critical floor will result in a system that cannot support the population growth and serve the community.

Other comments from the focus groups:

- The plan was not developed by the Vermont Futures Committee but by the State.

- The populated communities generally do not welcome sub-acute care facilities.

- There is an assumption that the Designated Hospitals can absorb the required beds through planned changes to their current systems. This assumption should be accurate if the Hospitals can plan for both structural and staffing changes. The ability to create segregated areas with private rooms and increased staffing ratios on an as needed basis is potentially unrealistic without infrastructure changes to create the new space. Staffing concerns for the intensity of these consumers were raised.

Potential Futures Plan Implementation Scenarios

We have identified three implementation scenarios for the adult mental health delivery system changes set forth in the Futures Plan. The three scenarios vary with the degree that the goals of the Futures Plan are followed and/or funded.

- **Scenario 1: Status quo remains –** Under Scenario 1, none of the changes proposed in the Futures Plan would be implemented. VSH (or a successor facility)

would operate as it currently does. The additional proposed community resources would not be created. The only changes to the need for adult mental health inpatient services are driven by demographic shifts and normal utilization trends. Scenario 1, while not very likely, is still very useful as a baseline scenario to determine what the needed bed capacity would be without the changes to the delivery system proposed in the Futures Plan.

- **Scenario 2: Partial implementation –** Under Scenario 2, construction of the new inpatient facility and non-inpatient alternatives are partially completed. Community resources are not fully funded or staffed. We assumed that one half of the planned additional community resources are added. Scenario 2 is a mid-point between Scenario 1 and Scenario 3.

- **Scenario 3: Full implementation –** All aspects of the Futures Plan are fully funded, fully staffed with qualified providers, and completed according to schedule. Scenario 3 is the best case scenario and shows what is possible under the best circumstances.

It is difficult to place probabilities on each scenario, although Scenario 1 seems the most unlikely.

Expected Impact of Implementation Scenarios on the Use of Adult Mental Health Inpatient Services

TMG was contracted to evaluate the subjective side of the proposal to close the VSH and create replacement inpatient capacity within one or more designated hospitals and new community based residential programs. The assumption is that fewer inpatient beds will be required if the residential programs are created due to evaluations of the severity of the consumers currently residing at the VSH. The review has indicated that as many as 15 consumers would be appropriate for and benefit from the planned residential facilities rather than a more restrictive environment such as VSH or another psychiatric inpatient setting.

Background for Evaluation of Scenarios

The increasing pressures on the community system must be resolved in order to relieve the inpatient hospital demands. The more robust the community system the more likely the

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Futures Plan, as currently written, can be achieved. The most significant services in diverting inpatient hospital stays are crisis stabilization and Community Rehabilitation and Treatment (CRT) services. Additional funding to expand crisis stabilization and CRT services is necessary in order to achieve the desired bed reductions and manage the increasing population over the next 10 years.

Expanding existing services does not result in immediate change. New programs take approximately six months to plan, develop and operationalize. Expanding existing programs also takes months. Staff must be hired and trained. Plans of care and service supports must be developed for new consumers. There is a limit to the number of new consumers that a staff person can manage

The creation of new community services in Vermont can be compared to the experience in Dane County, Wisconsin. Expansion to existing Community Support Programs (CSP) in Dane County, which are comprehensive services like Vermont's CRT services, added two new consumers per month in each of three CSPs. The existing staff worked the new cases into their existing caseloads after a redistribution of caseloads to new staff. A review of the service hours provided to the newly enrolled consumers supported this model due to the intensity of service hours provided in the first six months of the program. Consumers who are in the CSPs generally stabilize with the proper on-going supports and require less intensive services both in actual quantity and types of case management. Without additional staff, the current high consumer to staff ratio in the CRTs will prevent any quality expansion due to the intensive hours need to effectively manage the needs of the consumer and impact the need for inpatient hospitalization. The Vermont community system is currently at or beyond capacity.

The addition of crisis diversion beds requires staff training and supervision. The lack of these services in certain communities cannot be resolved in a short time frame. Appropriate providers must be located and funding must be provided for training and supervision. Expansion of a crisis system is an ongoing task and establishing a new provider can take three to six months, depending on the size of the provider. A crisis bed provided in a private home can be established in a matter of a few months. A facility with multiple beds can take a minimum of six months.

As new services are developed, the "woodwork effect" could occur. In Dane County, Wisconsin, the community at large that refers consumers for services such as CRT services recognized the new services quickly. Knowledge of the new services spread quickly,

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especially if they were created in communities that did not presently have them. Once it was known that there was new funding for CSP services in Dave County individuals began to call to request to move into the County. The need to fully assess consumers who are unknown to the system will slow the process of saturation down but, based upon the experience in Dane County, within six months the full effect should be realized.

Scenario 1 – Status Quo Remains

- No change to current adult mental health delivery system
- Projected bed capacity for adult mental health inpatient services is only influenced by:
  - Population growth and demographic changes in Vermont,
  - Mental health inpatient utilization trends
- The "woodwork effect" will not exist under this scenario since there is no change to the system.
- An implicit assumption is that community resources will grow at the rate of estimated utilization

Scenario 2 – Partial Implementation

- Projected adult mental health inpatient services are expected to be half way between Scenario 1 and Scenario 3.
- A delay in the implementation of the planned new facilities or a partial funding for the community based services will not cause an increase in inpatient days. A delay in construction will cause the system to remain status quo, creating no disruption to the planned change for the 15 consumers who are to be moved to a new sub-acute facility.
- Failure to provide needed funding for the community services will have an impact on the inpatient days relative to full implementation. Population growth will increase the need for community based mental heath services. Since these service systems are already stretched and experiencing staffing issues they will need to grow at least at the rate of population utilization. The high ratio of consumers to staff in the CRT programs shows this stress. The ratio is as high as 40:1 in Vermont, compared to Dane County, Wisconsin where 15:1 would be considered full capacity. The intensity

of the consumer needs and the inability to provide the time to address those needs due to large caseloads increases the risk of hospitalization.

- The "woodwork effect" could come into play if the community is expecting new facilities and they are delayed. There will be pressure to enter the hospital if it is seen as the only gateway to the new facilities. This pressure could occur as soon as the new facilities begin construction.

- The "woodwork effect" will also impact the community based service system. Some of the new community services are likely to be used by individuals not presently serviced by VSH. Increased demand is likely to occur once the new services are planned, not once the services are developed.

  The experience in Dane County, Wisconsin for a program change due to the movement of Medicaid fee for service dollars into a capitated system showed anticipation of services. Before the mental health benefit package was defined, consumers and their service providers were calling Dane County and making plans to have them relocate. The new consumers appeared without housing or other supports, to a service system that was not yet prepared to serve them. Thus they were quickly at risk of hospitalization or involvement with corrections. This situation is not unique to the Dane County, Wisconsin system. Vermont's community based system is in need of additional funding and staffing so increased community services will be partially used by individuals not presently served by VSH.

Scenario 3 – Full Implementation

- If the full system is established as planned the inpatient beds within the Futures Plan will be the floor for required capacity. Some of the new community resources will be used by individuals not presently served by VSH ("woodwork effect"). We estimate that 25% to 50% of the new sub acute facilities will be used by these "new" individuals.

- A full implementation of the Futures Plan, including the various community system supports, will create movement within the system and the desired changes over the course of one year after all resources are in place. It will take time to establish the sub-acute residential facilities and determine the consumers who need this level of care.

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Multiple visits and supports are needed to prepare a consumer to move to a new setting.

This issue was clearly articulated during the focus group discussions and has also been the experience within the Dane County, Wisconsin system. Consumers are often reluctant to change their environments. Their stability is often due to the consistency of the known environment and the relationships they have established with the staff in those environments. The plan to move as many as 15 consumers to new facilities is a huge undertaking that will take a great deal of additional staff time and many months. A minimum 12 month plan for this transition is needed and there must be a contingency plan for any moves that are not tolerated as assumed. It is possible that inpatient days might increase during this transition as consumers experience increased anxiety and resulting exacerbation of symptoms. The attempt to move a like group of consumers was made once before in Vermont and most returned to VSH. It will require time to phase in properly.

- The "woodwork effect" will have a more immediate impact in this scenario as providers and the community-at-large understand the new expanded services. In particular, the use of the new sub-acute facilities will be desired as clearly articulated in the focus group discussions. An increase of inpatient stays will be experienced if they are seen as the only entry point for the sub-acute facilities.

  In addition, the funding for new and expanded services to the community based system will not only create an increase in utilization, but could result in an influx of consumers from outside of Vermont. Dane County has seen such an influx for any and all new services that are developed, though movement to a new state may not occur as quickly. The border areas of surrounding states have low populations –though the Albany New York MSA has total population that is larger than Vermont. Consumers may relocate from other counties and from surrounding States that have inadequate service systems. Increased capacity, both perceived and real, can cause this increase. The mental health advocates, the mental health providers, and the natural support systems within the communities influence this effect. The initial impact will be greatest within the first six months and should level off after the initial year.

IV. EXPECTED IMPACT OF OTHER FACTORS ON THE USE OF MENTAL HEALTH INPATIENT SERVICES

This section of the report evaluates the expected impact of the health care and demographic trends on the use of adult mental health inpatient services over the next ten years.

We examined the following factors to determine their expected impact on future inpatient mental health usage in Vermont:

- Population growth and demographic changes in Vermont,
- Mental health inpatient utilization trends, and
- Changes to the Medicare payment methodology for inpatient mental health services.

In general, we anticipate an annual increase to the adult mental health inpatient utilization rate of 1.4% to reflect population growth and mental health utilization trends. We do not expect a material utilization impact due to changes to the Medicare payment methodology for inpatient mental health services.

Population Growth and Demographic Changes

We obtained Vermont population and demographic projections from VDH. The total Vermont population is expected to grow 4.2% from 2005 to 2015, from 625,975 to 652,199. The age 21 and over population is expected to grow 9.3%, from 463,761 to 506,942.

We examined the historical mental health inpatient utilization rates of the 21 and over population by age group compared to the population growth of each age group. We determined that the adult inpatient mental health utilization rate would increase by 4.1% (0.4% per year) from 2005 – 2015. The projected increase in adult utilization is lower than the projected increase in adult population because of shifts among the age groups. The age 50 and under population (who have high utilization rates) declined while the age 51 and over population (who have lower utilization rates) increased.

Our population growth adjustment is 0.4% per year.

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Mental Health Utilization Trends

We assumed an additional 1% annual trend rate for inpatient mental health utilization that is not associated with population growth. This rate is consistent with overall inpatient utilization rates. This rate of increase assumes that the historical level of utilization is appropriate – meaning neither overutilization nor underutilization (for example, due to capacity limits on beds available for long term stays) currently exists.

Changes to Medicare Payment Methodology

We reviewed the recent changes to Medicare's payment methodology for inpatient mental health services. Hospitals have historically been paid by Medicare for inpatient mental health using a cost-based methodology. For reporting periods beginning on or after January 1, 2005, hospitals will be paid a variable per diem rate for each day a patient is an inpatient (subject to a three year phase-in period). Per diems will vary by:

- Age
- DRG
- Various patient characteristics
- Various facility characteristics

The variable per diem rate decreases as the length of stay increases, from a high of 131% of the average per diem on day one to a low of 92% of the average per diem on days 21 and greater. There is an outlier provision for large cases.

The methodology change is intended to be budget neutral.

We do not expect a material impact to utilization rates due to this change in Medicare reimbursement. Both cost-based reimbursement and per diem reimbursement are volume-based reimbursement methodologies. Additional patient days equal more reimbursement. The basic incentive remains the same (unlike DRG case rate reimbursement, which rewards a facility for shortening length of stay).

It is possible that the declining per diem as a stay increases could reduce Medicare length of stay, which could create additional capacity in the system for non Medicare stays. However, it is also possible that declining Medicare lengths of stay are offset by readmissions of the same patient.

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V. PROJECTED 2016 ADULT MENTAL HEALTH INPATIENT BED CAPACITY NEEDS BY LEVEL OF CARE

We estimated the future needed inpatient bed capacity for adult mental health inpatient services using the following methodology:

1. Determine the current adult mental health inpatient average daily census by proposed level of care (developed in Section II of this report),

2. Apply estimated changes to adult mental health inpatient usage to determine the projected average daily census in 2016

    a. Impact of health care and demographic trends (developed in Section IV of this report)

    b. Impact of the delivery system changes outlined in the Futures Plan (developed in Section III of this report) – the impact is expressed as the number of beds expected to be diverted to the new level of care

3. Convert the projected 2016 adult mental health inpatient usage to a bed capacity that would be sufficient 90% of the time.

Tables 8, 9, and 10 below show the projection of adult mental health inpatient bed capacity for each of the three scenarios outlined in Section III of this report, Status Quo, Partial Implementation, and Full Implementation. We assume that the capacity for the ICU and SIP Unit levels of care will be housed at the new facility or facilities as described in the Futures Plan. The capacity for the General level of care will continue to be provided by Vermont and New Hampshire hospitals.

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Table 8
State of Vermont, Department of Health
Projection of 2016 Adult Mental Health Inpatient Bed Capacity
Status Quo Scenario

Level of Care	Current Daily Census	Population Trend Impact	Utilization Trend Impact	Beds diverted to			Additional needed capacity [1]	Total beds
				Sub-acute Facility	Secure Residential	Diversion Beds		
ICU	5.6	0.2	0.6	(0.0)	(0.0)	(0.0)	0.6	7.0
SIP Unit	45.7	1.9	5.0	(0.0)	(0.0)	(0.0)	4.4	57.0
General	95.2	3.9	10.4	(0.0)	(0.0)	(0.0)	10.0	119.5

[1] Additional needed capacity to reflect variation in average daily census. Additional beds are added so that the total capacity is adequate 90% of the time.

Under the Status Quo scenario, the new facility or facilities as described in the Futures Plan will need to have a capacity of 64 beds to meet the demand for adult mental health inpatient services (allowing for variation in the average daily census).

Table 9
State of Vermont, Department of Health
Projection of 2016 Adult Mental Health Inpatient Bed Capacity
Partial Implementation Scenario

Level of Care	Current Daily Census	Population Trend Impact	Utilization Trend Impact	Beds diverted to			Additional needed capacity [1]	Total beds
				Sub-acute Facility	Secure Residential	Diversion Beds		
ICU	5.6	0.2	0.6	(0.0)	(0.0)	(0.0)	0.6	7.0
SIP Unit	45.7	1.9	5.0	(5.0)	(3.0)	(0.0)	4.4	49.0
General	95.2	3.9	10.4	(0.0)	(0.0)	(2.5)	10.0	117.0

[1] Additional needed capacity to reflect variation in average daily census. Additional beds are added so that the total capacity is adequate 90% of the time.

Under the Partial Implementation scenario, the new facility or facilities as described in the Futures Plan will need to have a capacity of 56 beds to meet the demand for adult mental health inpatient services (allowing for variation in the average daily census).

Table 10
State of Vermont, Department of Health
Projection of 2016 Adult Mental Health Inpatient Bed Capacity
Full Implementation Scenario

Level of Care	Current Daily Census	Population Trend Impact	Utilization Trend Impact	Beds diverted to			Additional needed capacity [1]	Total beds
				Sub-acute Facility	Secure Residential	Diversion Beds		
ICU	5.6	0.2	0.6	(0.0)	(0.0)	(0.0)	0.6	7.0
SIP Unit	45.7	1.9	5.0	(10.0)	(6.0)	(0.0)	4.4	41.0
General	95.2	3.9	10.4	(0.0)	(0.0)	(5.0)	10.0	114.5

[1] *Additional needed capacity to reflect variation in average daily census. Additional beds are added so that the total capacity is adequate 90% of the time.*

Under the Full Implementation scenario, the new facility or facilities as described in the Futures Plan will need to have a capacity of 48 beds to meet the demand for adult mental health inpatient services (allowing for variation in the average daily census).

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